

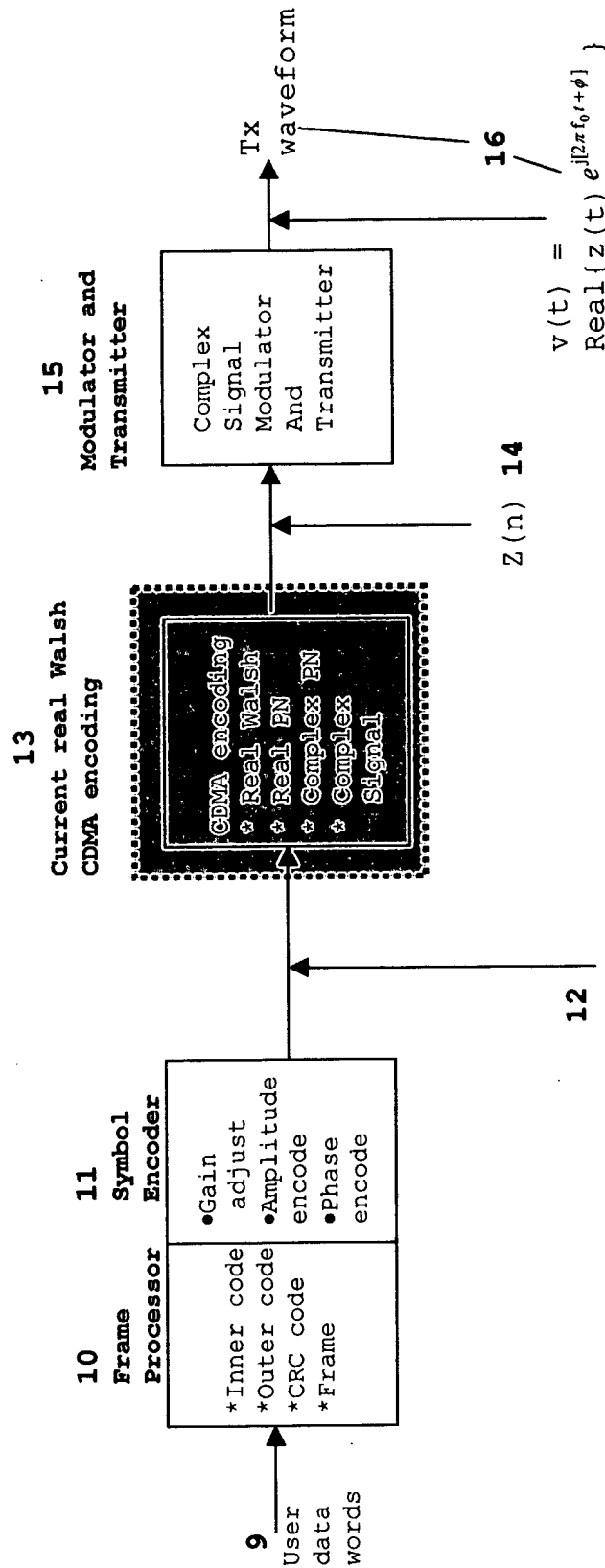
APPLICATION NO. 09/826,117

INVENTION: ~~Hybrid~~ Complex Walsh Codes for CDMA

INVENTOR: Urbain A. von der Embse

DRAWINGS AND PERFORMANCE DATA

FIG. 1 CDMA Transmitter: Block Diagram



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FIG. 1 CDMA Transmitter: Cellular Application

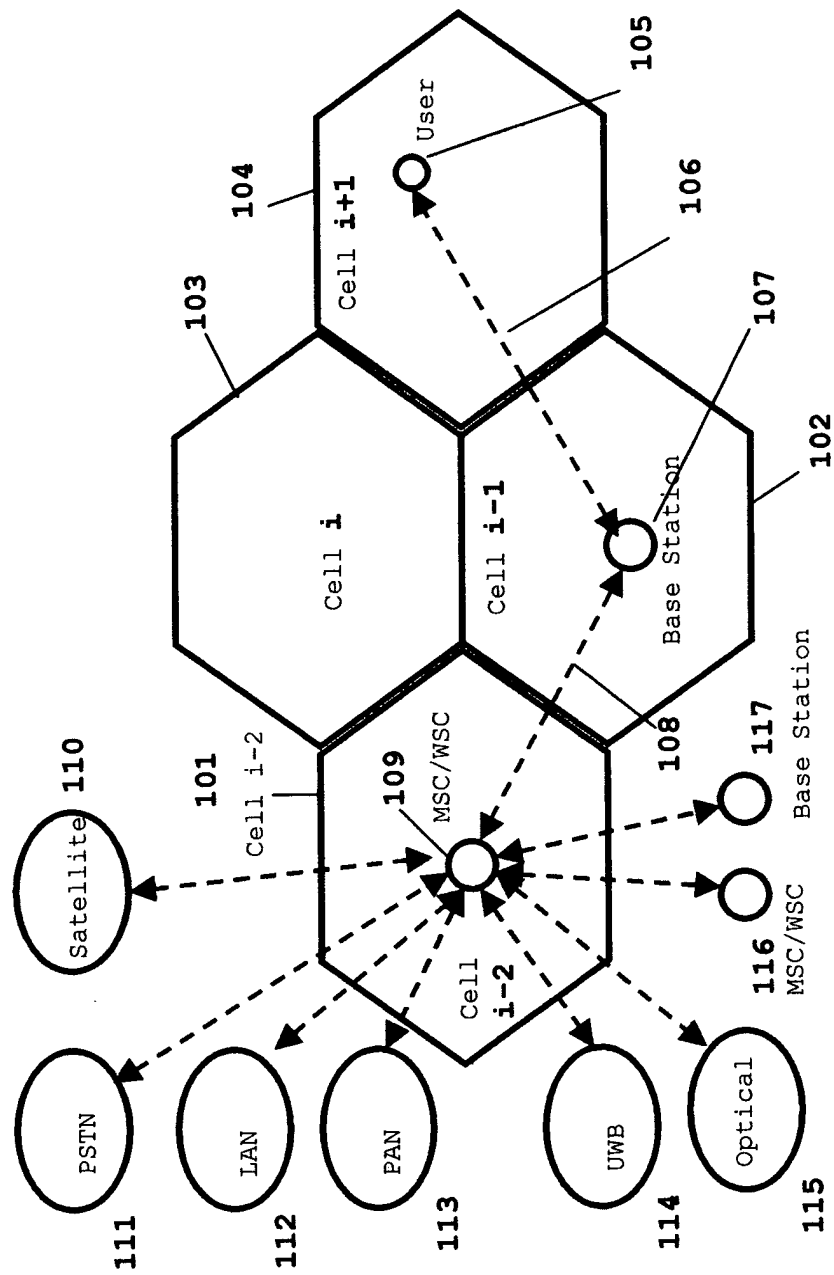


FIG. 2 Real Walsh CDMA Encoding

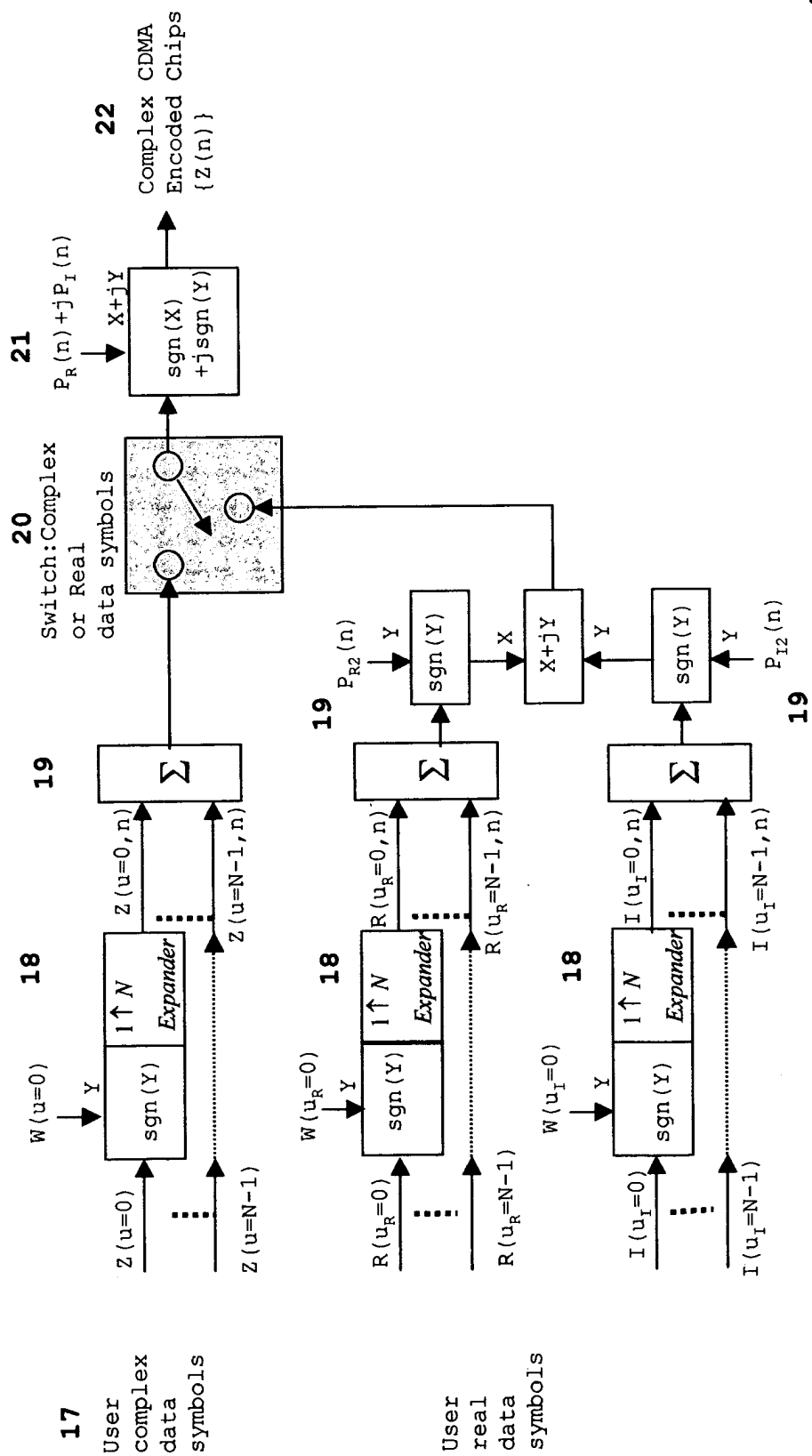


FIG. 2 CDMA Transmit Signal Processing

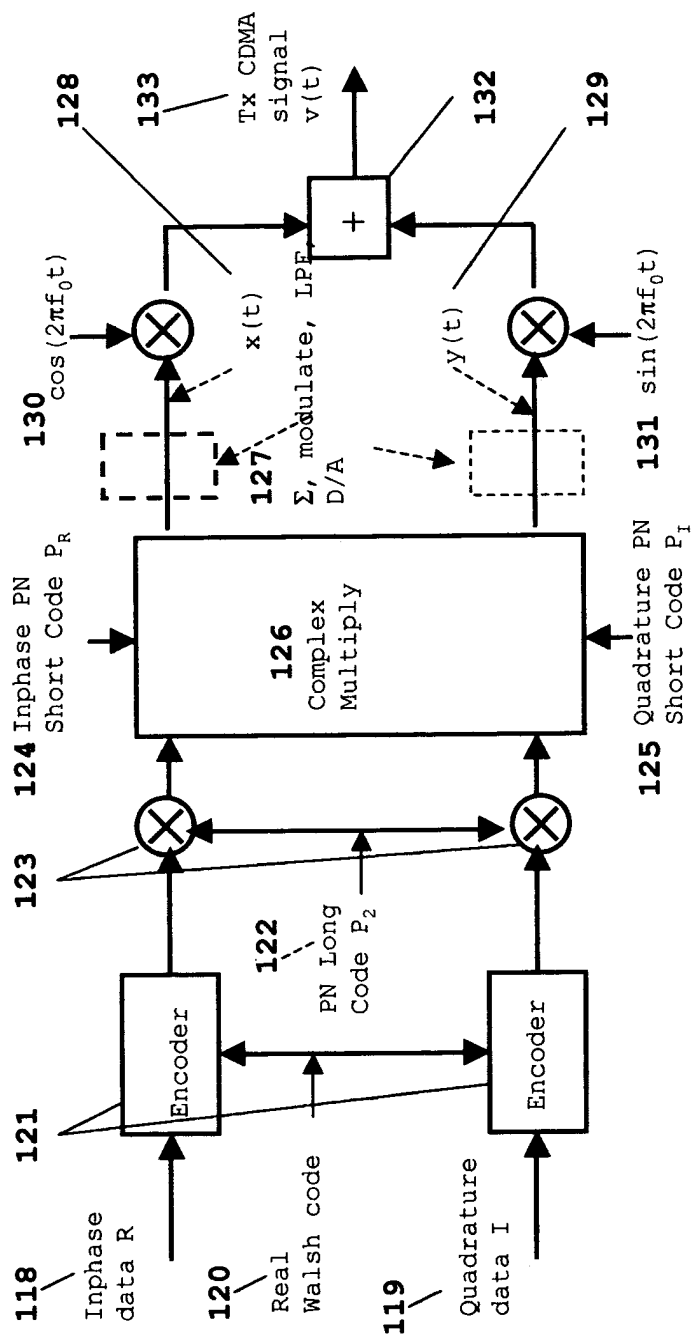


FIG. 3 CDMA Receiver Block Diagram

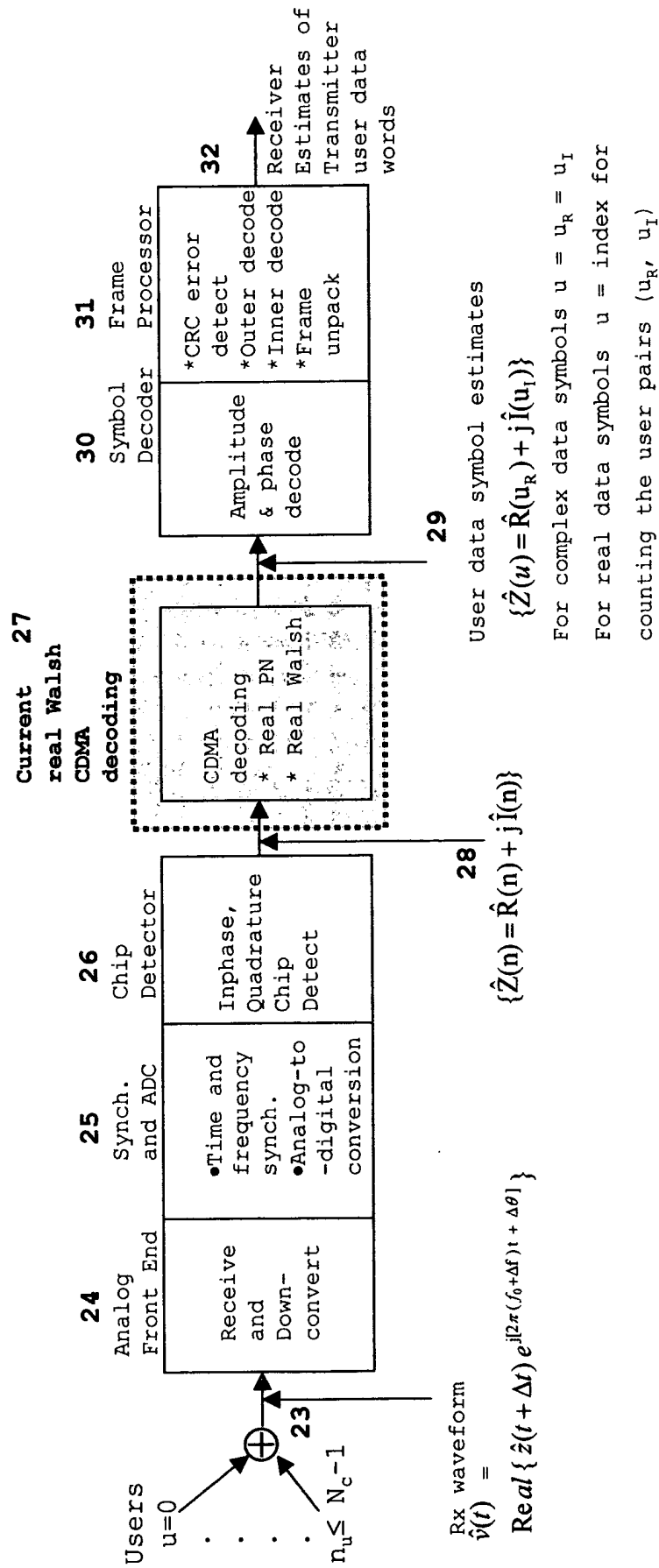


FIG. 3 CDMA Receive Signal Processing

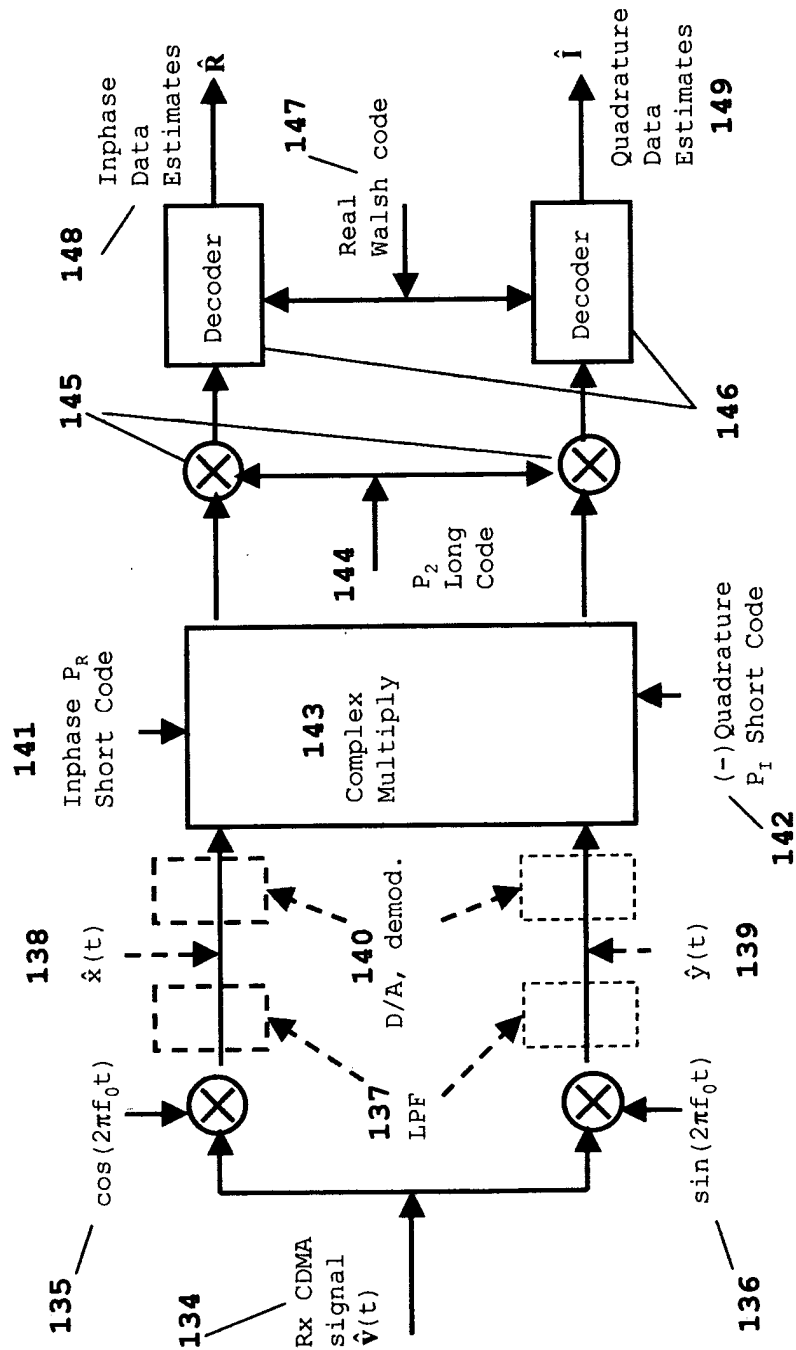
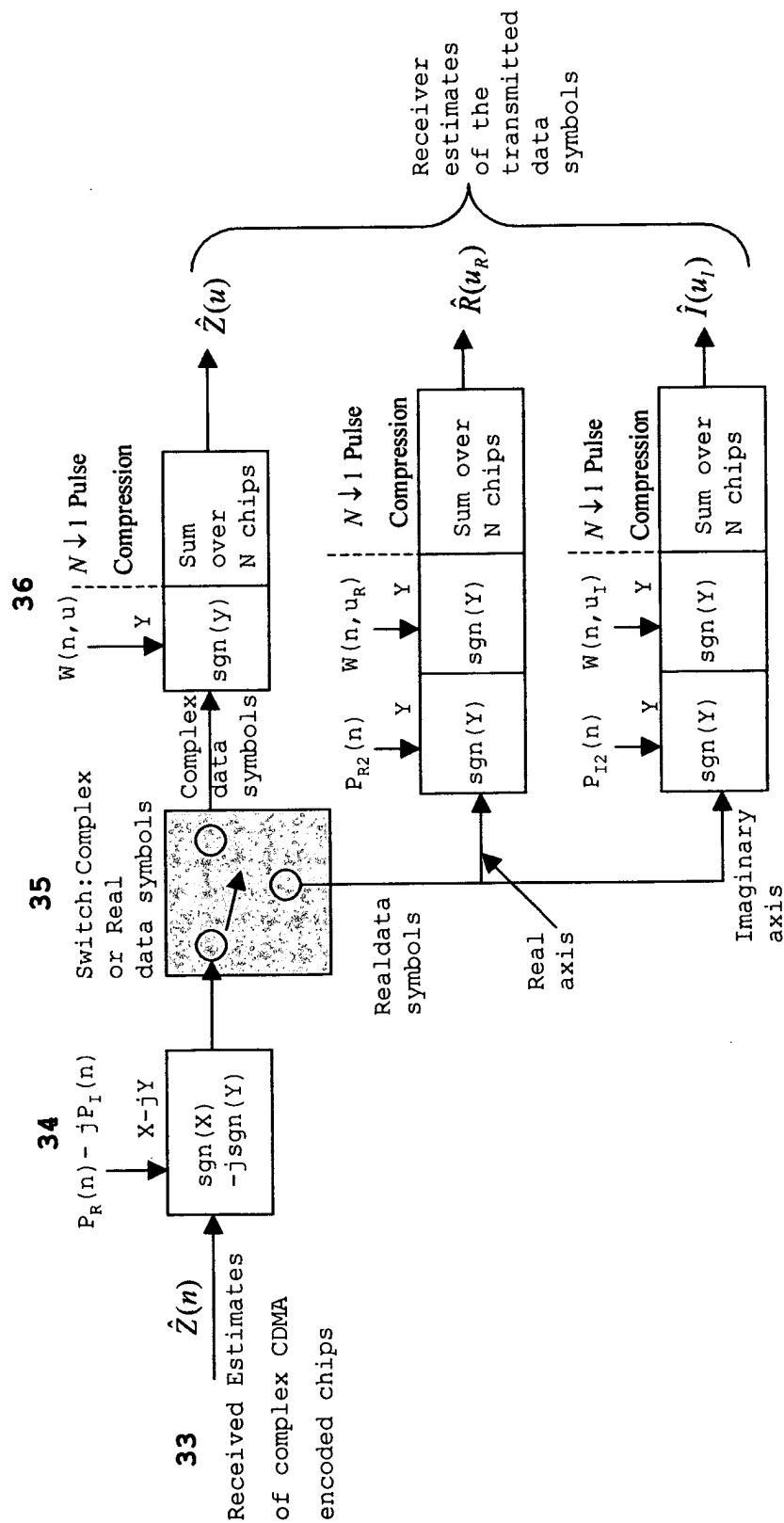
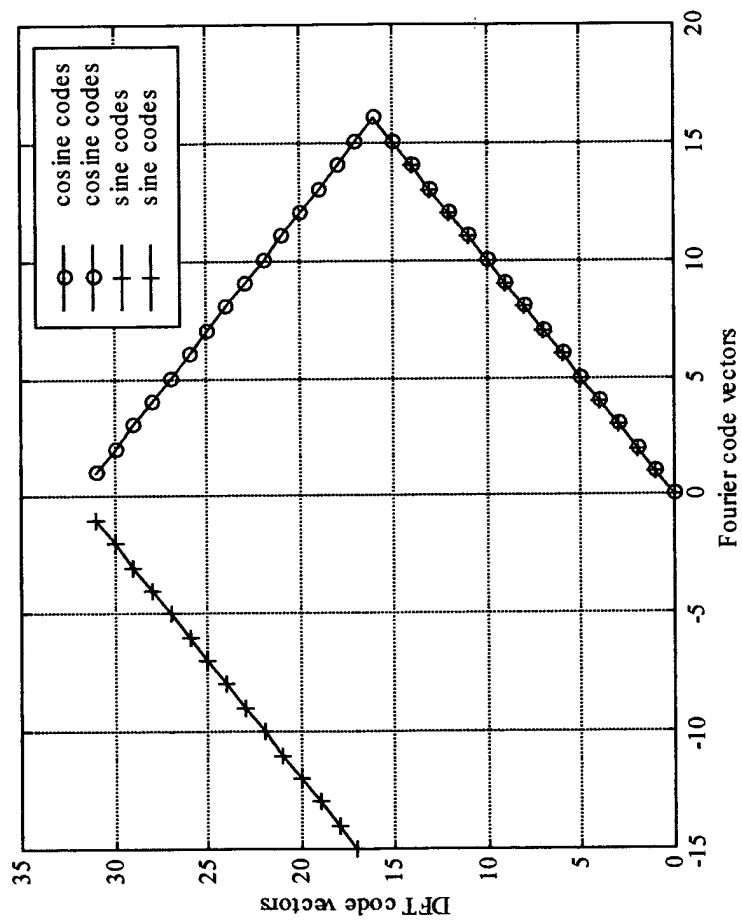


FIG. 4 Real Walsh CDMA Decoding



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**FIG. 5 Correlation of Fourier Codes
with DFT Codes for N=32**



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FIG. 5A Hybrid Walsh Implementation Algorithm

168	Sequence index	Hybrid Walsh reordering permutation of the real Walsh code vectors	
	$u=0, 1, \dots, N-1$	Hybrid Walsh inphase (real) code vector $W_R(u)$	Hybrid Walsh quadrature (imaginary) code vector $W_I(u)$
167	$u = 0$ $u = 1 \text{ to } (N/2-1)$ $u = N/2$ $u = N/2+\Delta u$ for $\Delta u=1 \text{ to } N/2-1$	$W_R(u) = W(0)$ $W_R(u) = W(2i)$ $W_R(u) = W(N-1)$ $W_R(u) = W(N-1-2\Delta u)$	$W_I(u) = W(0)$ $W_I(u) = W(2u-1)$ $W_I(u) = W(N-1)$ $W_I(u) = W(N-2\Delta u)$

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FIG. 5B Hybrid Walsh Implementation Algorithm

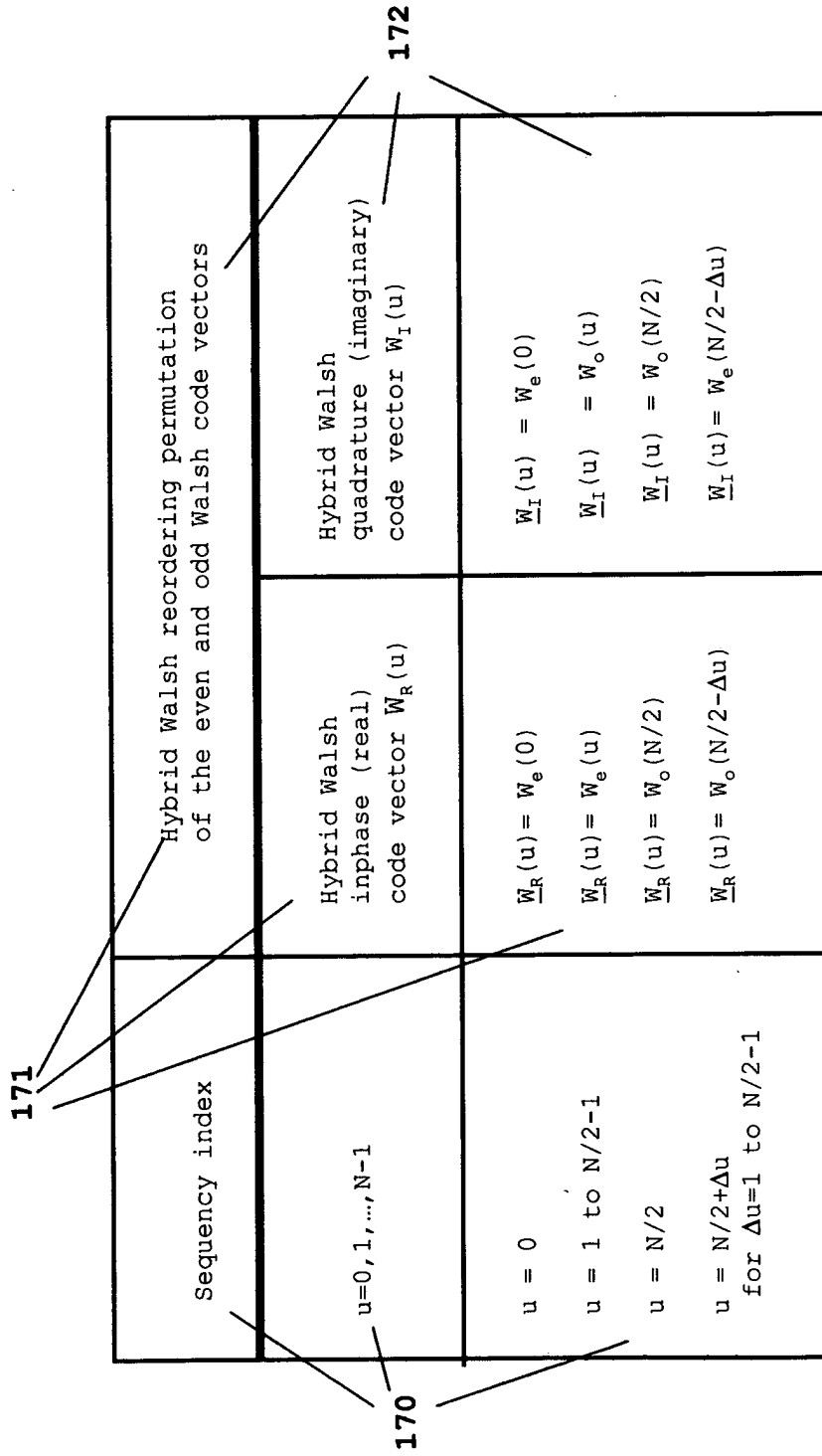


FIG. 6 Complex Walsh CDMA Encoding

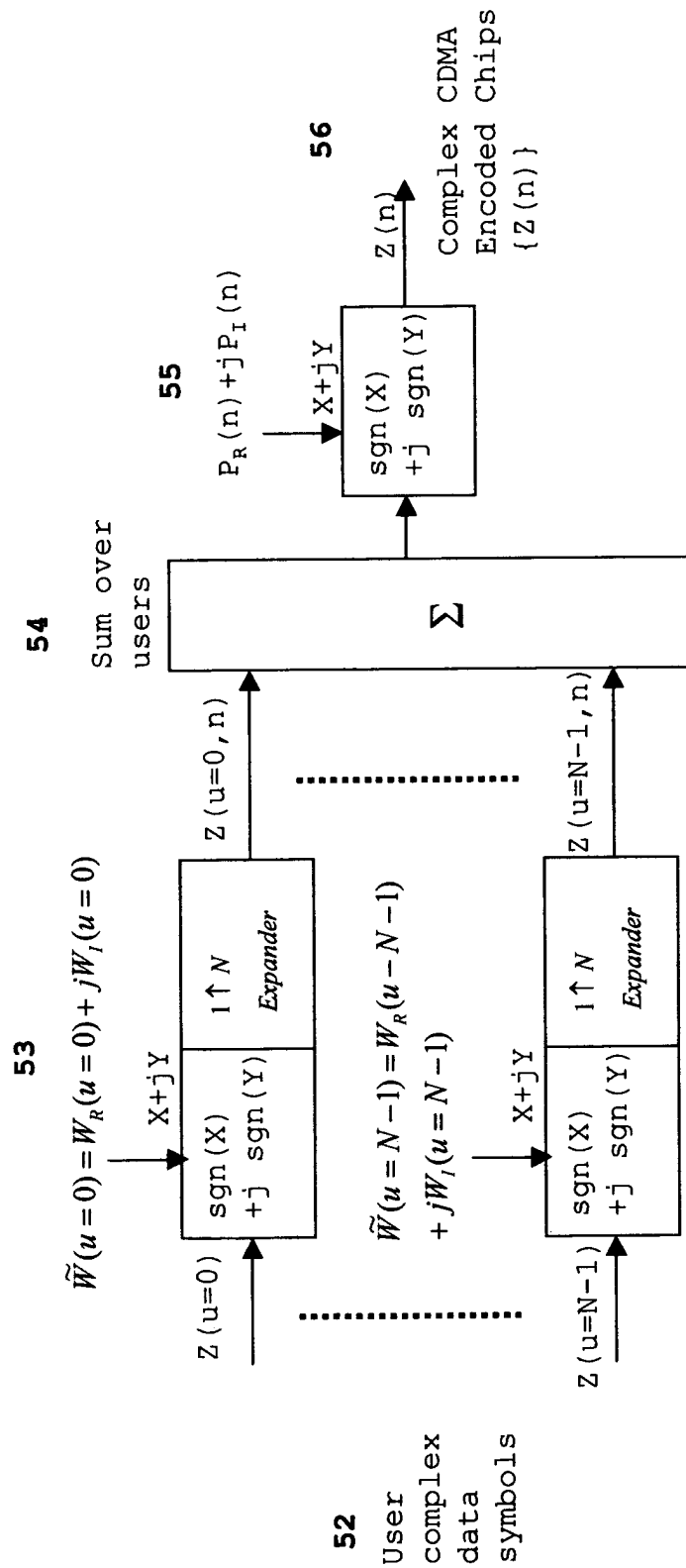


FIG. 6 Hybrid Walsh Transmit Signal Processing

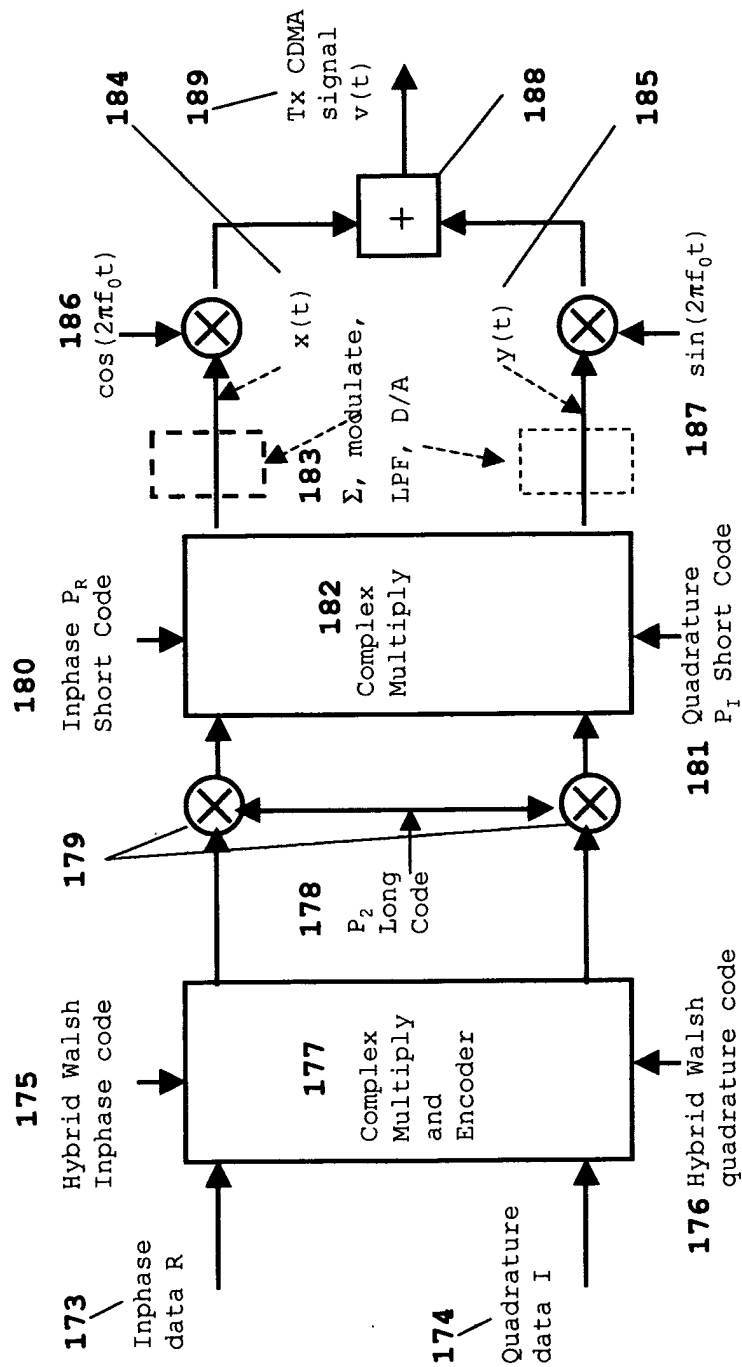


FIG. 7 Complex Walsh CDMA Decoding

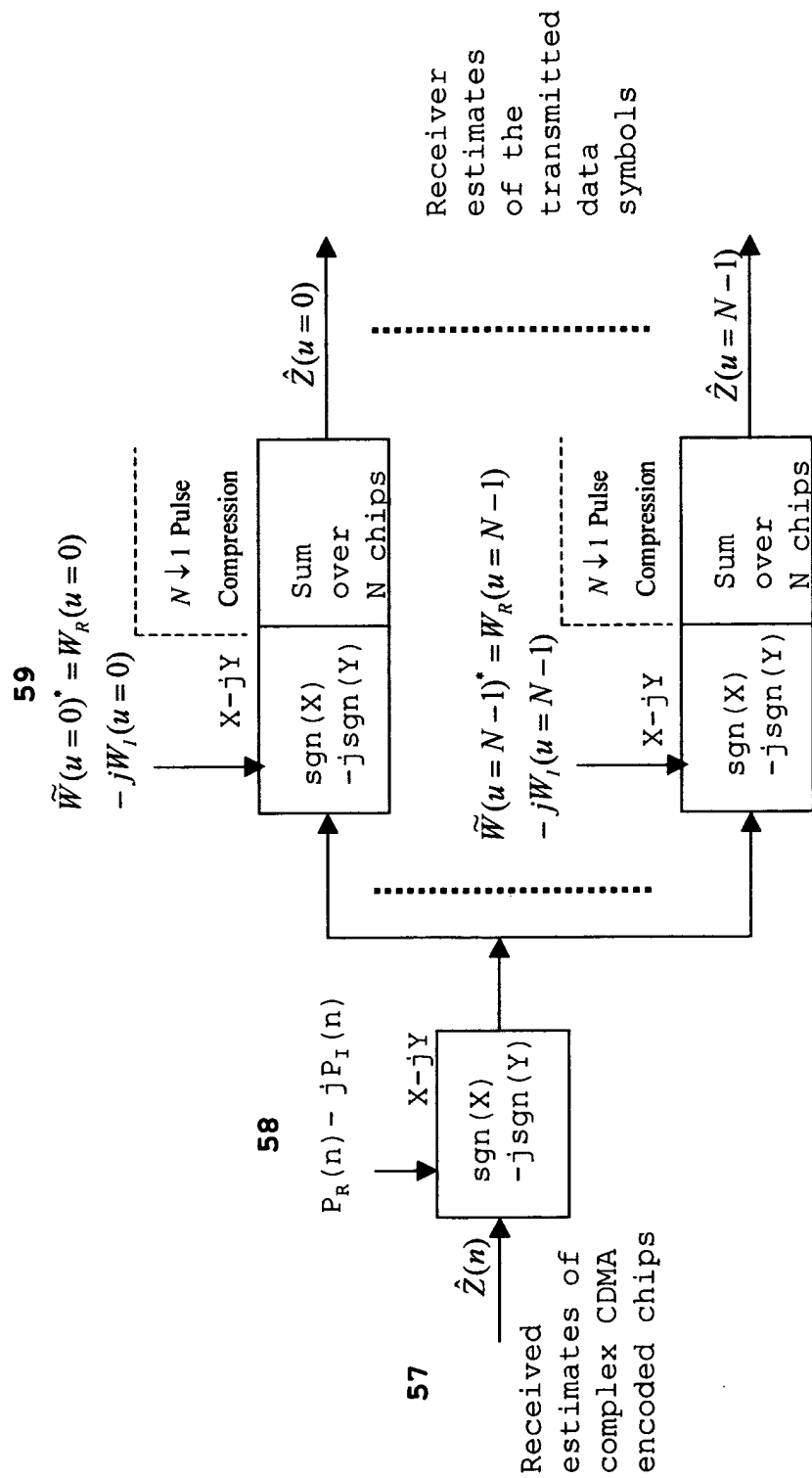


FIG. 7 Hybrid Walsh Receive Signal Processing

